PROGRESS REPORT

FOR

THE PERIOD MARCH 1974 - MAY 1974

E-Series

FOR

SKYLAB STUDY OF WATER QUALITY

NASA CONTRACT NAS 9-13271

EREP PROPOSAL NO. 540-GI

TASK-347

SITES -416 + 423

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SUMMARY OF RESEARCH OBJECTIVES

Two Kansas reservoirs will be studied using Skylab data in conjunction with simultaneous ground truth information in an attempt to detect and monitor various parameters of water quality. Water samples will be collected from the reservoir or reservoirs under investigation and low-level aircraft support missions will be flown to acquire photographs which will approximate the spectral coverage of forthcoming Skylab photographs. Image analysis and data processing techniques will be developed to aid in the correlation of Skylab data with ground truth data and supporting aerial photography.

A. OVERALL STATUS

We have received 4X enlargements of S-190A photography taken over southeast Kansas on September 18, 1973 along track 58. These transparencies should assist our study of the three lakes sampled Toronto, Fall River, and Elk City. These lakes are quite small on 70mm. photos and as a result film analysis is difficult. Available apertures for our Macbeth EP1000 macrodensitometer are too large too make any measurements totally within the boundaries of any of the three lakes under study. This of course negates the measurement of smaller areas within the lake in order to detect tonal variations across the surfaces of the lakes. Use of 70mm. photos on the IDECS is also hampered by the small size of the three lakes since the vidicon does not magnify sufficiently to allow meaningful image enhancement and level slicing. The 4X enlarged transparencies however, are of sufficiently large scale to permit both densitometer and IDECS analysis of the three southeast Kansas lakes.

IDECS analysis has been performed on both S-190A and B photography. The results confirm first-look conclusions that some tonal differences exist between lakes but that the lakes themselves show very little internal tonal variation. The only reservoir to display tonal variations detectable by IDECS using density-to-hue conversion is Elk City Reservoir. Two different tonal regions can be separated on the lake but only on the red band of the S-190A and on S190B photography.

The tonal variation in this lake is most likely due to differences in the amount of suspended solids. Water samples bear this out in that samples collected from the lighter region show concentrations of suspended solids that are higher than those from the darker region.

S-192 screening film has been received for SL-4 EREP pass 97 on January 31, 1974. This pass covers lakes in Southeastern Kansas and Northeastern Oklahoma. Appropriate channels have been ordered which will be useful in supplementing S-190A and B photography.

B. RECOMMENDATIONS CONCERNING DECISIONS AND/OR ACTIONS REQUIRED TO ENSURE ATTAINMENT OF THE EXPERIMENT'S SCIENTIFIC OBJECTIVE

NONE.

C. EXPECTED ACCOMPLISHMENTS DURING THE NEXT REPORTING PERIOD

Densitometer measurements of the three southeast Kansas reservoirs will be compared with the various water quality parameters measured from the samples collected during Skylab overflight. Analysis of S-192 imagery and CCT'S which have been ordered will also begin during the next period upon their receipt.

D. SIGNIFICANT RESULTS AND THEIR RELATIONSHIPS TO PRACTICAL APPLICATIONS OR OPERATIONAL PROBLEMS

NONE.

E. SUMMARY OUTLOOK FOR THE REMAINING EFFORT TO BE PERFORMED

Analysis of S-190A and B photography will continue and will receive primary attention during the next period. No difficulties are anticipated in the

processing and analysis of additional EREP data which has been requested. Work on these products will commence upon their arrival.

F. TRAVEL SUMMARY AND PLANS

NONE.

G. FINANCIAL REPORT

A statement of financial status for this project will be sent under separate cover by the CRINC accounting office.